Virtual Tour

Ames Consolidated Information Technology Services 3 (ACITS 3)

NNA10301939R

September 7, 2010

Purpose

- This presentation is provided in lieu of a site tour of NASA Ames Research Center and its other sites referred to in the ACITS 3 Statement of Work.

- The slides that follow provide comprehensive information and the images depict the facilities that will be used under this contract.

NASA Ames Research Center (ARC)

- NASA Ames Research Center (ARC), one of 10 NASA field installations, is located at Moffett Field, California. NASA ARC was founded December 20, 1939 as an aircraft research laboratory by the National Advisory Committee for Aeronautics (NACA). In 1958 it became part of the National Aeronautics and Space Administration (NASA).

Information Technology Division (Code I) Overview

- As a leader in information technology research with a focus on supercomputing, networking, and intelligent systems, Ames conducts the critical research and development (R&D) and develops the enabling technologies that make NASA missions possible.

N233 Central Computer Facility

Information Technology Division (Code I) Overview

- To accomplish its mission, the Center depends heavily on state-of-the-art IT, embracing computer systems ranging from laptop and desktop personal computers to mid-range computers and supercomputers; network systems ranging in size and complexity from those supporting individual buildings up to and including those serving the entire Ames facility; data storage facilities ranging in size from compact disks to massive, centrally-accessed tape storage systems; and all of the associated operating, input/output, data transfer, data management, and data analysis systems.
- NASA's focus on science and discovery requires innovation at all levels, including IT services. Ames is already a demonstrated Agency IT leader in the areas of high performance networking, cloud computing, security, and web technologies.

Information Technology Division (Code I) Overview

- ARC expects that cloud computing will continue to be an ARC area of interest. As such, ongoing R & D will be required to maintain ARC's current leadership position and to continually deliver new cloud capabilities that are suitable for addressing NASA's unique mission challenges. In most cases, the innovation involving NASA cloud services will focus on providing solutions that the commercial marketplace cannot address due to the unique needs of NASA's missions. Some examples of areas needing innovative solutions to meet NASA's needs are the management of massive data storage capacities, very high performance networking, and security. In short, ARC will not simply operate a cloud-computing environment for NASA but instead will drive cloud computing innovation within the Federal Government, especially as it can be applied to address science challenges.

ACITS 3 Contract Scope Overview

- The ACITS 3 procurement will provide ARC with contractor support in the following areas:
  - IT Systems & Governance Support
  - IT Security Support
  - Network and Communication Systems & Support
  - Application Management & Support
  - Scientific Computing Systems & Support
  - Innovation and Emerging Technologies
  - Outreach/Informational Systems & Support.

ACITS 3 Strategy Overview

- The goal of the ACITS 3 contract is to obtain responsive, innovative, state-of-the-art, efficient information technology services for NASA Ames Research Center (ARC) by applying a sound management and technical approach that will provide the best value and meet the defined requirements.

ACITS 3 Facilities

- Place of Performance
  - The majority of work will be performed at Ames Research Center, Moffett Field, California.
  - Temporary duty at other NASA centers, and other locations as specified by NASA, may be required.
  - The contractor may be required to travel to other domestic and international facilities and locations.

IT Systems & Governance Support Facilities

The ARC Data Center is currently comprised of facilities in Buildings N233, N254, and M16, and in a container implementing state-of-the-art cloud technology. NASA expects that the location and number of facilities will be dynamic over the life of the ACITS 3 contract.

N233 Room 165 – Data Center

N233 Room 170 – Data Center

IT Systems & Governance Support Facilities

N233 Room 150 – Data Center/Local Area Network (LAN)

IT Systems & Governance Support Facilities

N254 Room 101
Data Center

N254 Room 109 – Data Center & Emergency Communications

N254 Room 131 – Data Center, Wide Area Network (WAN), and portions of Nebula (ARC's cloud effort)

IT Systems & Governance Support Facilities

M16 Room 118 - Data Center

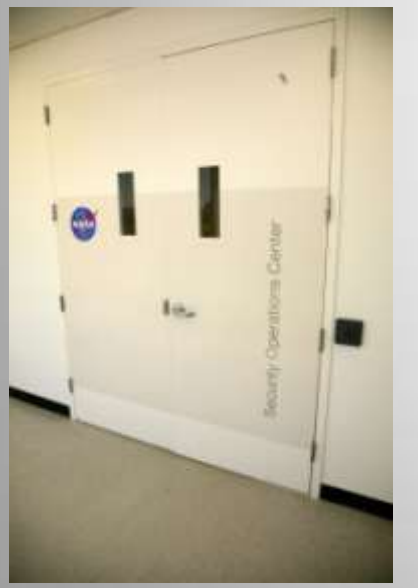
IT Systems & Governance Support Facilities

N254 Room 131 – Portions of Nebula Data Center

Nebula container (Data Center) located behind N254

IT Security Facilities

The ACITS 3 contractor will be responsible for the maintenance and operations of the ARC Institutional IT Security Systems including firewalls, intrusion detection and prevention, IT security support systems, vulnerability and patch management, incident response and forensics, log aggregation, and correlation.



N254 – SOC – Security Operations Center

Network and Communication Systems & Support Facilities

The Network and Communication Systems and Support area is focused on operating, maintaining, managing, researching technologies for infrastructure improvement, and implementing changes to the infrastructure necessary to enable and enhance communications between human and computer customers and clients.

N233 Room 150 – Local Area Network (LAN) & Data Center

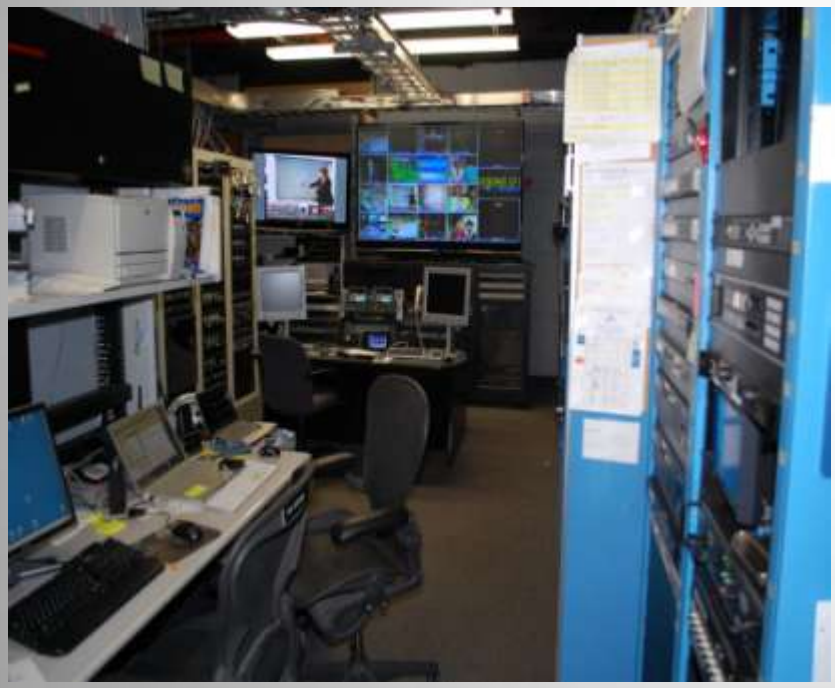
Network and Communication Systems & Support Facilities

N233 Room 131 – Wide Area Network (WAN) & Data Center

Network and Communication Systems & Support Facilities

N233 Room 151 – Network Operations Center (NOC)

Network and Communication Systems & Support Facilities



N240 Room 220 – Video Control Center

Network and Communication Systems & Support Facilities

N263 (Interior) Voice Communication Switch

Network and Communication Systems & Support Facilities

N254 Room 109 – Emergency Communications

B158 Emergency Communications Center

Emergency Radio Truck

Emergency Radio Antennas

Network and Communication Systems & Support Facilities

Manhole & Cable Plant Underground Vaults
located at numerous locations around the Center

Application Management & Support Facilities

N233 Room 165 – Data Center used for Application Management & Support

This area consists of IT applications management, business systems, and support required for the daily business processes and services necessary to operate the Center (e.g., financial services, human resources, IT and personnel security, logistics, and business system infrastructure). Coordination and integration with current and future applications and business systems at the Center and across the Agency is critical to the efficient and effective operations of NASA in general. Specific business systems may be managed and operated from a single NASA organization for the entire Agency, while other systems are managed and operated separately by each NASA Center.

Science Computing Systems & Support Facilities

Scientific Computing consists of designing, developing, installing, modifying, configuring, operating, and maintaining software and computing systems in order to solve computationally intensive and/or complex engineering and scientific problems in support of ARC missions, programs, and projects.

Air Traffic Management Simulation

Current or future ARC mission areas, programs, and projects that the ACITS 3 contractor will support include, but are not limited to, aircraft modeling and design, flight simulation, air traffic management simulation, tilt rotor, cockpit design, and headset design. During the life of this contract, Task Orders (TOs) may be written to support similar work within the Center (by programs or organizations) that also fall within these IT areas.

Innovation and Emerging Technology Facilities

NASA's focus on science and discovery requires innovation at all levels, including IT services. The Ames campus and its involvement with NASA activities provides a wide range of opportunities which technology leaders can identify as suitable for the application of innovative approaches and emerging technologies.

Nebula Container "Cloud Computing" located behind N254

Outreach/Informational Systems and Support Facilities

N233 Room 195 – NASA Information Technology Customer Care Center (NICCC)

The ACITS 3 contractor shall provide products and services to assist customers with basic use of equipment and applications and provide prompt response and resolution to user problems. Services include establishing and maintaining a call support center/help desk response plan, a response team, and a continuous improvement plan based on customer feedback and benchmarking.

Current Environment

- The following slides are intended to provide ARC's industry partners with an overview of current programs, projects, priorities, and budget projections.
- Potential offerors are cautioned that
  - these are merely examples of programs and projects that they could be required to support if awarded the ACITS 3 contract. These programs and projects may be replaced or supplemented by other programs or projects necessitating the support of the ACITS 3 contractor.
  - the priority listing provided is dynamic and is intended only to provide industry with a sense of the types of issues that are currently at the forefront of ARC strategy.
  - budget projections are reflections of current funding and task orders. These profiles may change as NASA budgets fluctuate and as a result of ARC's transition to I3P. They are not intended as obligations to be applied to any contract award and may change at any time.

Customer Profiles

(FY10 Data)

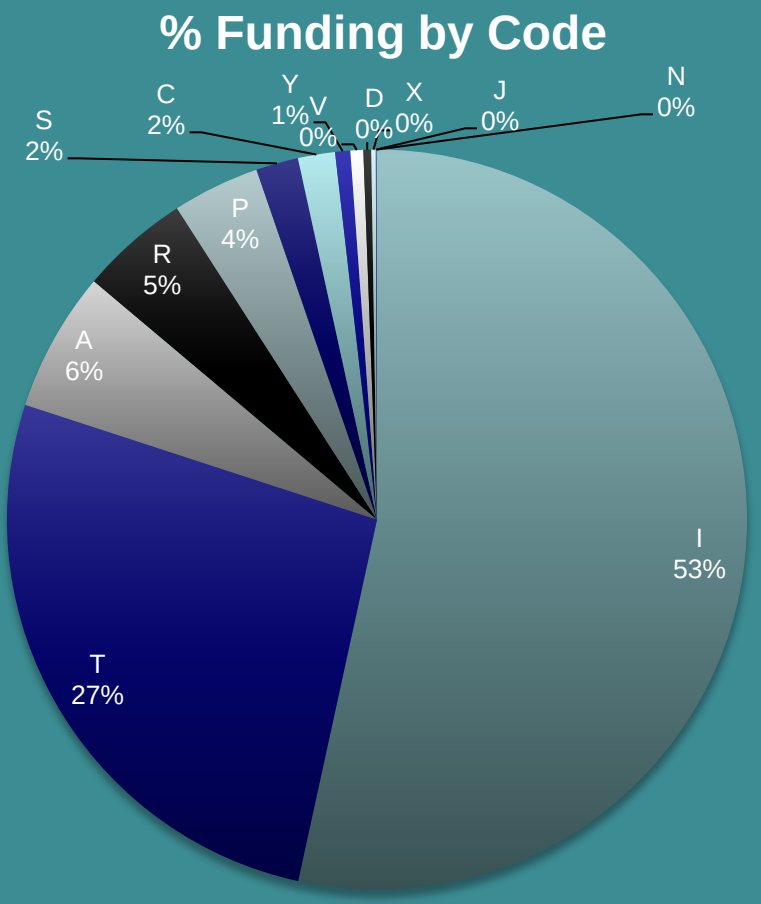
Org	Directorate Title	% Funding	Amount ($M)	% Tasks	# of Tasks
I	Information Technology	53.41%	$29.643	26%	15
T	Exploration Technology	26.60%	$14.763	38%	22
A	Aeronautics	6.12%	$3.397	10%	6
R	Engineering	4.77%	$2.647	5%	3
P	Programs & Projects	3.81%	$2.115	2%	1
S	Science	1.85%	$1.027	7%	4
C	Chief Financial Officer	1.62%	$0.899	3%	2
Y	Aeroflightdynamics	0.66%	$0.366		
V	New Ventures & Communications	0.56%	$0.311	3%	2
D	Director	0.34%	$0.189	2%	1
X	Federal Aviation Administration	0.20%	$0.111		
J	Center Operations	0.04%	$0.022	3%	2
N		0.01%	$0.006		
	TOTAL		$55.494		58

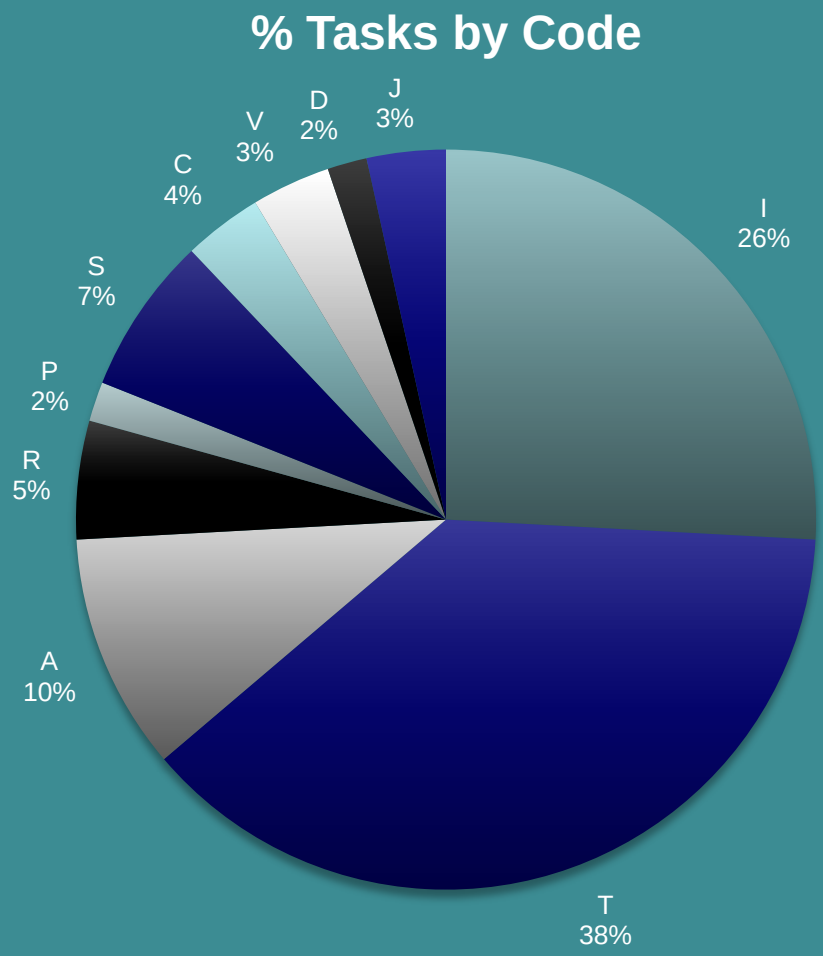
Support requirements span multiple Directorates at ARC, other NASA Centers and NASA Headquarters, as well as other federal organizations and agencies (e.g., DoE and FAA), and related organizations.

Budgets Estimate by Customer & FY

Org	Directorate Title	% Funding	FY11 $M	FY12 $M	FY13 $M	FY14 $M	FY15 $M	FY16 $M
I	Information Technology	53.41%	$16.023	$38.989	$38.455	$37.921	$38.989	$25.637
T	Exploration Technology	26.60%	$7.980	$19.418	$19.152	$18.886	$19.418	$12.768
A	Aeronautics	6.12%	$1.836	$4.468	$4.406	$4.345	$4.468	$2.938
R	Engineering	4.77%	$1.431	$3.482	$3.434	$3.387	$3.482	$2.290
P	Programs & Projects	3.81%	$1.143	$2.781	$2.743	$2.705	$2.781	$1.829
S	Science	1.85%	$0.555	$1.351	$1.332	$1.314	$1.351	$0.888
C	Chief Financial Officer	1.62%	$0.486	$1.183	$1.166	$1.150	$1.183	$0.778
Y	Aeroflightdynamics	0.66%	$0.198	$0.482	$0.475	$0.469	$0.482	$0.317
V	New Ventures & Communications	0.56%	$0.168	$0.409	$0.403	$0.398	$0.409	$0.269
D	Director	0.34%	$0.102	$0.248	$0.245	$0.241	$0.248	$0.163
X	Federal Aviation Administration	0.20%	$0.060	$0.146	$0.144	$0.142	$0.146	$0.096
J	Center Operations	0.04%	$0.012	$0.029	$0.029	$0.028	$0.029	$0.019
N		0.01%	$0.003	$0.007	$0.007	$0.007	$0.007	$0.005
	TOTAL		$29.997	$72.993	$71.993	$70.993	$72.993	$47.995

Customer Profiles





ACITS 3 to I3P Transition Strategy Overview

- As the I3P contracts are awarded, there will be no disruption of service and/or quality of service of the tasks being transferred to I3P.
- ACITS 3 contractors and customers will coordinate and cooperate with the I3P contractors on an initial and daily basis before, during, and after transition.
- After transition of tasks from ACITS 3 to I3P, the ACITS 3 contractor will successfully integrate its innovation efforts with I3P operations.

ARC CIO Priority List

The following is a list of current ARC CIO priorities. This list is dynamic. Only portions of these tasks are currently supported through the current ACITS 2 contract. Some items may transition to I3P contracts in the future.

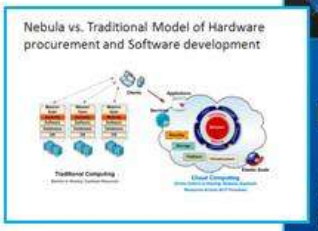
- Nebula – Cloud Computing Platform
- Security Operations Center (SOC)
- ARCLAN Upgrade
- Data Center Improvement
- IT Service Integration Management
- VPN Migration
- NASA Account Management System (NAMS)
- Code Q Applications Migration
- Human Research Program Information Technology (HRP-IT)
- Smart Card – Logical Access

ARC CIO Priority List

Project Priority #1

Nebula in conjunction with GSFC: NASA's Science-Class Cloud Computing Platform

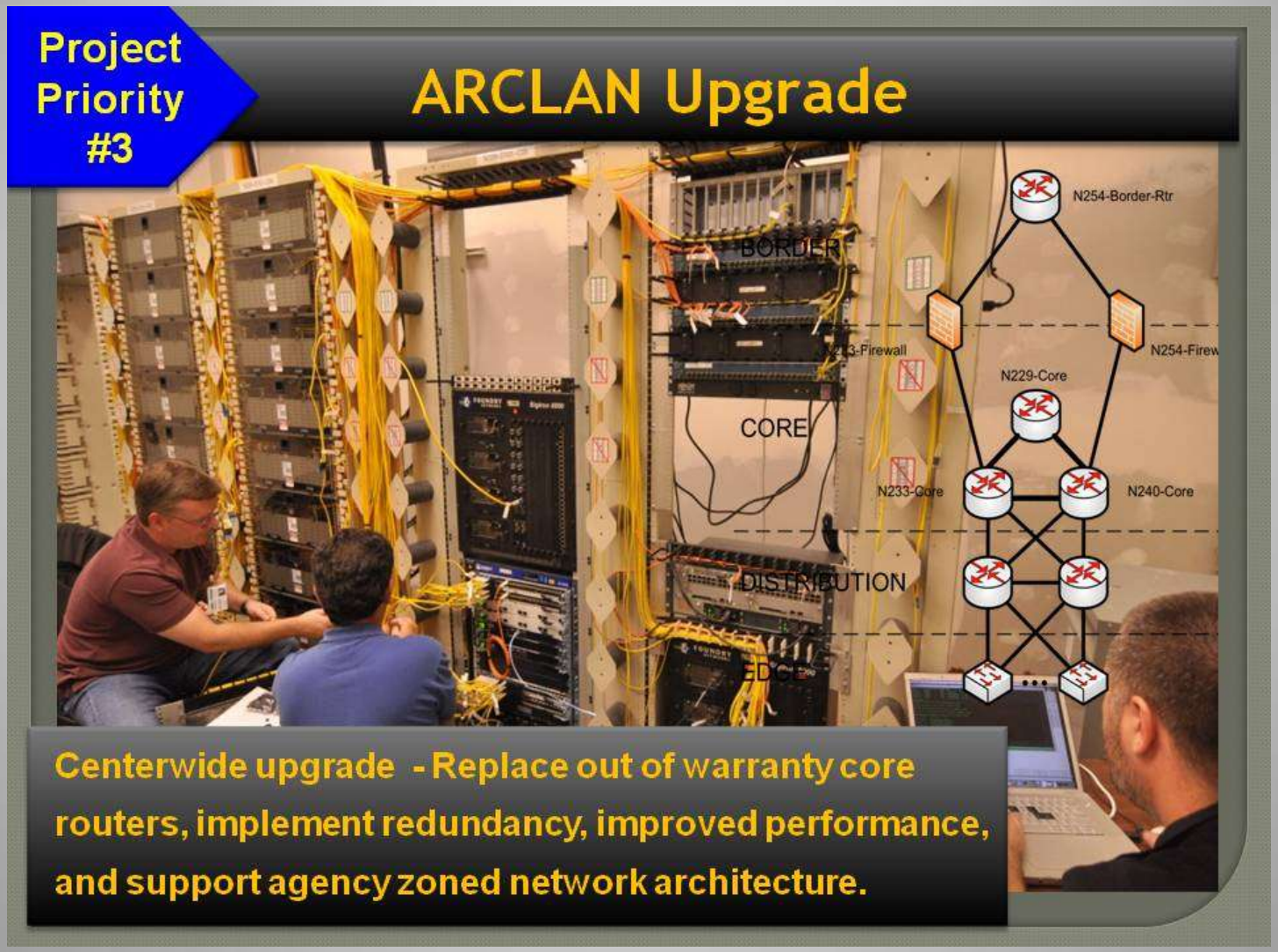
Nebula allows NASA scientists to access high-capacity compute and storage virtualized without buying servers, software, data center space or network equipment.



http://nebula.nasa.gov

ARC CIO Priority List

ARC CIO Priority List



ARC CIO Priority List

ARC CIO Priority List

Project Priority #5

NASA Ames IT Service Integration Management

Service Integration Management will leverage ITIL v3 framework to support an online service catalog, aligning and enhancing IT service delivery and management across the Code I directorate.

People

Customer Focused

Improved internal and external customer communication driven by a services oriented organization.

Key processes will facilitate increased integration and cross-functional capabilities throughout organization.

Processes

ITIL Core Processes

Implementing ITIL based processes to improve IT service delivery and management in the areas of:

- Incident Management
- Problem Management
- Change Management
- Configuration Management

Technology

Service Catalog

Developing a web based tool to allow ARC users to:

- search, select and order IT services, authorize the service request
- track the status of request
- have the provisioning of services be workflow engine driven

ARC CIO Priority List

Project Priority #6

VPN Migration

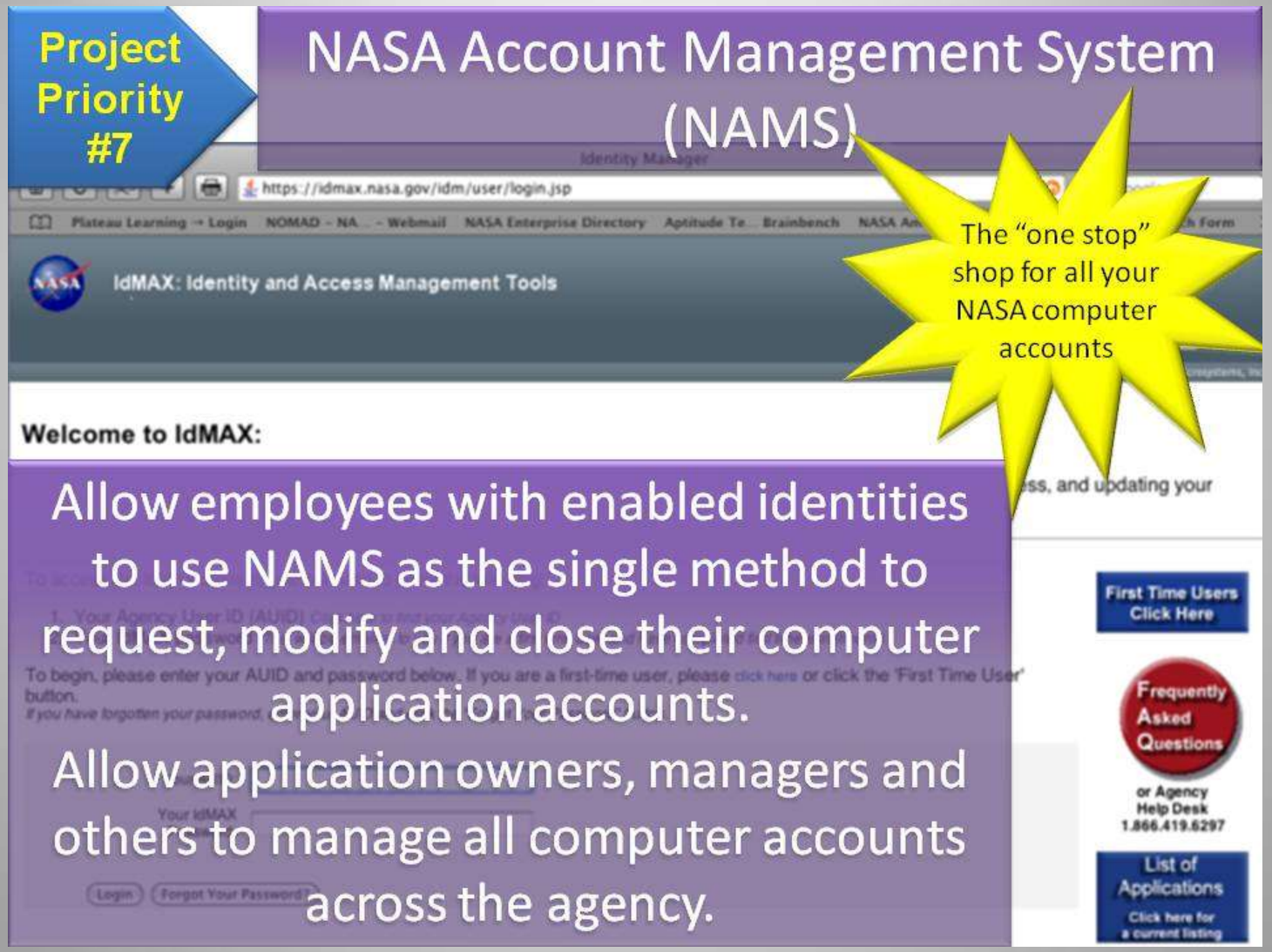
Keeping you securely connected to Ames IT at home or on the road

- Upgrades Aging Cisco Solution to Juniper Solution
- Decreases your passwords to remember by using your Active Directory credentials
- Compatible with RSA tokens
- Will support authentication using your NASA SmartCard
- Provides ability to be "green" by working remotely if needed

Secure Access to Information Anywhere Anytime

Learn more @ share.nasa.gov/arc/it/services/vpn/Pages/default.aspx

ARC CIO Priority List

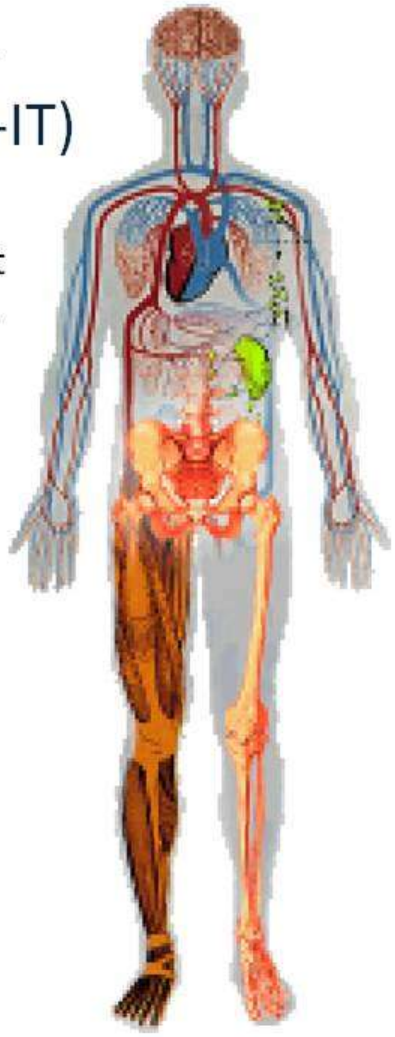


ARC CIO Priority List

Project Priority #9

Human Research Program- Information Technology (HRP-IT)

Research, document and analyze the present state of the HRP IT system architecture, establishing guidelines and best practices in our identification of change recommendations.



ARC CIO Priority List

Project Priority #8

Code Q 4D Applications Migration

Enhancing our safety environment by simplifying reporting and improving access to information

- Provides web based access for reporting and accessing safety information
- Makes Safety information easier to find and learn quickly
- Allows center staff to make safety suggestions online
- Generates a web based user interface for: Contractor Monthly Accident Report, QH Task database, Hazard Reporting System, Safety Suggestion System, ERT System, AED System, and the Ames Safety Accountability Program

Stay Safe – Stay Informed

ARC CIO Priority List

Stakeholder Project Background

- Contractor support provided under ACITS 3 to efforts directly in support of or managed by Code I represents just more than half of the total support envisioned. The remainder of the support to ARC Directorates other than Code I (hereafter referred to as “stakeholders”) is focused on R & D in support of NASA projects and programs
- The ACITS 3 contractor support to stakeholders will provide IT professionals and subject matter experts in such diverse areas as aeronautics, space science, science, and human factors. These contractor employees will perform in the discipline areas of software development, systems integration, testing, and other such disciplines needed to support the stakeholder’s projects. Among the occupational categories that may be required are scientists, aeronautic engineers and experts, and air traffic controllers.
- The following slides provide background ACITS 3 task information for the two largest stakeholders, Code A and Code T.

Next Generation Air Transportation System

(Code A, Aeronautics Directorate)

The NextGen Airspace Project, under the Airspace Systems Program, directly addresses the fundamental air traffic management (ATM) research needs for NextGen by developing revolutionary concepts, capabilities, and technologies that will enable significant increases in the capacity, efficiency and flexibility of the National Airspace System (NAS).

NextGen Airspace Project Separation Assurance Support
(Code AFD, Aviation Operation Systems Development Branch)

Provide software development and maintenance for the NextGen Airspace Project Separation Assurance (SA) research focus area (RFA).

NextGen Concepts & Technology Development Project Traffic Flow Management and Airspace Super Density Operations
(Code AFH, Aerospace High Density Operations Branch)

Provide software development and maintenance for the NextGen Concepts and Technology Development Project Traffic Flow Management (TFM) and Airspace Super Density Operations (ASDO) RFAs. Perform data collection, reduction, and analysis for the NextGen Concepts and Technology Development Project, with a focus on airspace super density operations.

NextGen Concepts and Technology Development Project DAC Support
(Code AFO, Systems Modeling & Optimization Branch) /
ATC Familiarization Support
(Code AF, Aviation System Division)

Provide air traffic controller (ATC) subject matter expertise to the Dynamic Airspace Configuration (DAC) research focus area (RFA) and other RFAs, to provide ATC familiarization to NextGen researchers, and to support SmartSkies education activities.

Air Traffic Management and Human-in-the-Loop Flight Simulation

(Code A, Aeronautics Directorate)

The Aviation Systems Division conducts research and development in two principal areas: air traffic management and human-in-the-loop flight simulation. Code AFD develops and tests software for air traffic management research using real-time data.

Aviation Systems Division Technical / Programmatic Support
(Code AFD, Aviation Operation Systems Development Branch)

Provide collaborative workflow architecture support

Provide programmatic support to Code AF (e.g., desktop publishing, document support, multimedia conferencing, IT facilities support, technical library, Facility Safety Manager (FSM), web development and maintenance.

Project Highlights
(Code TH, Human Systems Integration Division)

The Human Systems Integration Division advances human-centered design and operations of complex aerospace systems through analysis, experimentation, and modeling of human performance and human-automation interaction to make dramatic improvements in safety, efficiency, and mission success.

Airspace Operations Laboratory Support

Provide software (development, integration, enhancement, and testing), hardware integration, data collection, and database management in support of the Airspace Operations Laboratory (AOL), enhancements to the Multi-Aircraft Control Simulator (MACS), air-ground simulation experiments, statistical analysis of collected data, route construction/analysis and fast time aircraft simulation, and systems engineering.

Fatigue Risk Management System (FRMS) Support

NASA's objective is to provide the technology and methodology to enable a data-driven and scientifically based process for an air carrier to continuously monitor and manage safety risks associated with fatigue-related error; i.e., a Fatigue Risk Management System (FRMS). NASA has entered into a collaborative research agreement under which it will be granted access to: Aircraft Performance Data; Schedule data (rosters); and Physiological and Cognitive Data. The accomplishment of the required research will entail the acquisition, processing, integration, and interpretation of large quantities of diverse numerical and textual data. Operational data on operator physiological effects will need to be combined with performance data to ascertain operational indicators, and operational effects of fatigued pilots. The requirements are to review, analyze, and interpret this data acquired during two experiments (one with flight crew and one with cabin crew). Identify fatigue drivers using the SAFTE (Sleep, Activity, Fatigue and Task Effectiveness) model, modified as appropriate for the available data, and the associated computer application called FAST (Fatigue Avoidance and Safety Tool) and determine the effects of scheduling strategy on crew performance to the extent possible with the limited data. Identify the measurements and data collections that are operationally feasible for an air carrier to use to support a data-driven FRMS.

Project Highlights
(Code TH, Human Systems Integration Division)

(Continued from Slide 46)

Risk Perception in Distributed Team Decision Making

With regards to long-duration space missions, Gender and individual composition of teams, training, and effects of sleep deprivation, task stress, and interpersonal stress on team performance can influence distributed team decision making. Develop technologies to monitor crew psychosocial interactions and to predict breakdowns in crew adjustment and performance. Team Decision Making includes laboratory technical support, design, specification, installation and maintenance of laboratory including hardware and software, consultation with research staff on technical issues, creation of Audio-Visual and communications data, assistance running experimental crews, and ASRS Report Coding.

Training, Automation, and Operational Decision Making (ODM)

Develop and evaluate new approaches to training focused on Operational Decision Making (ODM) in increasingly automated aerospace environments. This task will involve developing computer simulation capabilities, designing and developing training concepts and experimental protocols, general laboratory management, data analysis and report preparation. The simulation capability element will include low-fidelity tools development, experimental control programs, and data acquisition and preliminary analysis programs.

Project Highlights
(Code TH, Human Systems Integration Division)

(Continued from Slide 47)

Visual Simulation and Visually Based Control Research

Develop and evaluate new techniques for visual simulation and visual displays to enhance vehicle control. Requirements are to develop simulation capabilities, design and develop display concepts and experimental protocols, general laboratory management, data analysis and report preparation. The simulation capability element will include visual database development, experimental control programs, and data acquisition and preliminary analysis programs. The laboratory management element will include determining hardware, software requirements to meet the other elements, assisting with upgrades, and design, and report preparation. Innovative visual simulation techniques, including virtual windows, head mounted display systems, and custom-designed rendering software will be utilized.

Spatial Auditory Displays Laboratory

This lab provides facilities for psychoacoustic research in spatialized audio. The lab and experiments run therein are very technical in nature, technical support is required for almost all lab activities. Tasks include writing experiment software, lab utilities, and demos, maintaining the audio lab environment, updating systems, and configuring equipment.

Project Highlights
(Code TH, Human Systems Integration Division)

(Continued from Slide 48)

Test Subject Recruitment Office

Provide IT database development, and management of the research subject database, and research test subject recruitment and scheduling. Human test subjects will test software, hardware, and simulation capabilities developed by systems software engineers, and will also participate in experimental studies by NASA researchers where data is collected, analyzed and published.

Aerospace Cognitive Engineering Group Support

Provide support to extend the Matessa-Polson list model and Pavlik memory theory work in ACT-R to provide training time and error prediction capabilities. Specifically it is the aim of this work to provide the prediction capabilities in such a form that they can be integrated into CogTool.

Human Eye Movements and Visual Perception

Develop, test, and validate software for visual stimulus generation as well as data acquisition and analysis for an eye-movement and visual perception research laboratory (Visuomotor Control Lab). The lab and experiments run are very technical in nature, technical support is required for almost all lab activities. Activities include writing experiment software, lab utilities, and demos, maintaining the lab environment, updating systems, and configuring equipment.

Project Highlights
(Code TH, Human Systems Integration Division)

(Continued from Slide 49)

Human Manual and Operational Control Performance

Perform study to determine whether it would be feasible to assess the impact of visual function differences on operational performance using flight simulators. Develop operational scenarios to test the operational impact of vision, conduct studies to assess the impact of vision on operational performance, and provide further assessment of projector and image generator technology capabilities.

Concept User Interface Redesign of the Jet Propulsion Lab (JPL) Deep Space Network (DSN) Displays

The JPL DSN is a group of communication facilities supporting satellites and spacecraft. The three DSN facilities are in Spain, Australia and the United States (near Barstow, California). Operators view console displays to track and monitor the communication status of the network. These displays could be improved from a user interface design perspective to provide better situation awareness, increased efficiency and reduced workload for the operators. The objective is to develop redesign concepts that mitigate the significant interface design flaws (and operator complaints) of the system, with a focus on identifying interface design and information management techniques that would potentially support the concept of a single operator monitoring more than one antenna.

Project Highlights
(Code TH, Human Systems Integration Division)

(Continued from Slide 50)

Human Automation Interaction Support

A goal of the Human Systems Integration Division is to advance human-automation interaction within the space exploration domain. Develop software tools that support various aspects of human and robotic space flight. Develop user interfaces that control and manage simulators for training of astronauts and flight controllers. Develop prototype code to support demonstrations and advanced concepts. Participate in application architecture design. Work closely with design team to implement detailed design specifications. Develop new features for production applications.

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Project Highlights
(Code TH, Human Systems Integration Division)

(Continued from Slide 51)

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Project Highlights
(Code TH, Human Systems Integration Division)

(Continued from Slide 52)

Generic Airspace Operations Research Support

Develop and evaluate new approaches for Generic Airspace Operations and provide air-traffic controller expertise to support requirements for Distributed Airspace Configuration (DAC) research. Support the FAA's Generic Airspace project by developing interface and visual design enhancements and procedures for the Controller Information Tool (CIT) and other air traffic control displays. Provide computer graphics, rapid prototyping, and research support. Participate in design and development of aeronautical research simulations, participate in actual simulation experiments, data collection, and analysis. Evaluate software developed and provide feedback to development engineers. Attend NASA workshops and meetings as needed to provide air traffic controller perspective and insight.

Human Centered Systems Laboratory (HCSL) Support

Support Next Generation Air Traffic System (NGATS) Research, Aviation Safety Program (AvSAFE), and other NASA or FAA programs. Plan and conduct simulation studies. Analyze and summarize the collected study data and prepare presentation materials to describe the results of the studies. Design, develop and support hardware systems and computer programs required to conduct said studies.